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The Southern Pines

Forest Service

U. S. DEPARTMENT OF AGRICULTURE

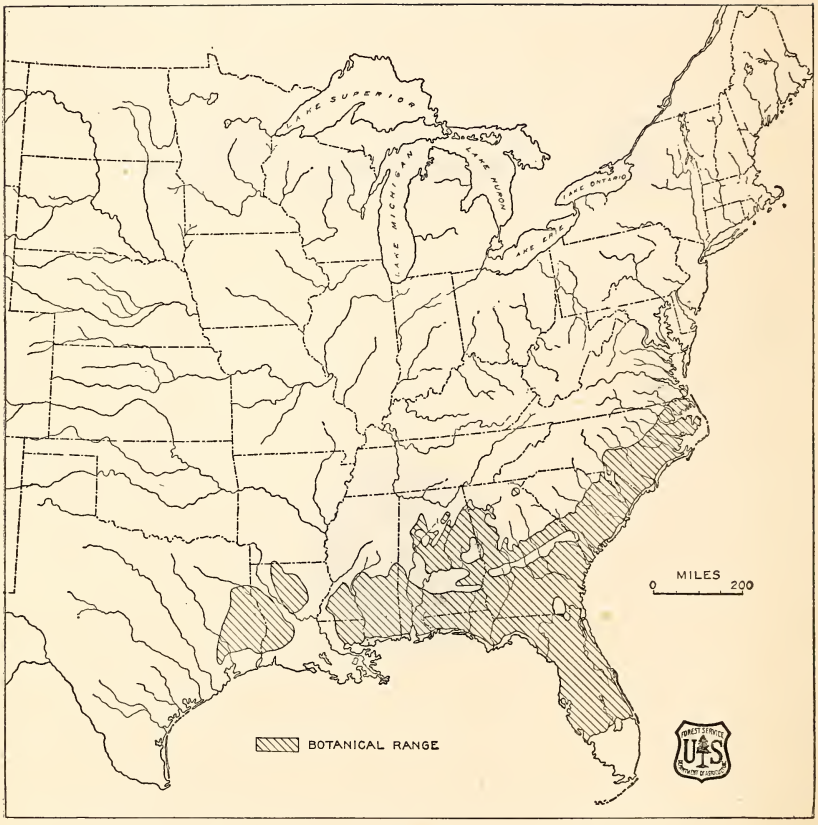

FIGURE 1.—Range of longleaf pine (*Pinus palustris*).

THE SOUTHERN PINES

By H. S. Betts, *senior engineer, Division of Forest Products*

The southern pines (also known as the southern yellow pines) grow principally in the Southeastern States which border on the Atlantic Ocean and the Gulf of Mexico. They include longleaf pine, slash pine, shortleaf pine, loblolly pine, and several other pines[1] of less importance. Since 1900 these pines have furnished approximately one-third of the lumber produced annually in the United States, and as a group continue to supply more lumber than the nearest competitor, Douglas-fir, which, however, is approaching them in quantity production.

The wood of the southern pines varies widely in quality. Typical longleaf and slash are heavy, hard, and resinous, while typical shortleaf is comparatively light in weight, soft, and has little resin. There is also considerable variation in the wood of any one species of the southern pines. Loblolly may approach longleaf and slash in weight and hardness or may be comparatively light in weight and soft and more like typical shortleaf in quality.

The southern pines are used principally for building construction of all kinds, railway ties, poles, cooperage, veneer, and piling. Large quantities are also used in the manufacture of paper. In recent years the southern pines have taken the leading place as pulpwoods and now furnish nearly twice as much material for paper pulp as the nearest competitor, hemlock. Longleaf and slash pine trees are the sources of turpentine and rosin. The wood of these pines is also used in various distillation and extraction processes for the production of wood turpentine, pine oil, pine tar, and other products.

The southern pine forests have been a source of lumber and naval stores from the time of the first settlements. The bulk of the cutting, however, has been done since 1890. The remaining supplies of old-growth southern pine saw timber probably amount to not more than 3 percent of the original stand and make up about 10 percent of the present stand of saw timber which is composed largely of second growth. The cutting of this second-growth timber while the trees are still comparatively small (often for pulpwood) and the tapping of small trees in turpentine operations tend to limit the size and quality of second-growth material. Because of uncontrolled fires in certain regions and the absence of seed trees, large cut-over areas of southern pine have been slow to restock. However, with protection from fire and grazing animals[2] and with reasonable care in management and cutting, these second-growth stands are capable of producing large quantities of saw timber.

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[1] Pitch pine (*Pinus rigida*), Virginia pine (*Pinus virginiana*), pond pine (*Pinus rigida serotina*), sand pine (*Pinus clausa*), and spruce pine (*Pinus glabra*).

[2] Hogs are particularly destructive to longleaf pine seedlings. Sheep and goats are destructive to all seedlings. Cattle also do considerable harm to young growth.

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Nomenclature.—Considerable confusion exists with regard to the names of the southern pines. Specifications that call for "southern pine" often allow the wood of any or all of the pines in question, provided it meets quality requirements. Commercially, southern pine lumber is often roughly divided into two classes, longleaf and shortleaf. Longleaf (largely made up of true longleaf and slash) includes the dense, close-grained, heavier wood, while shortleaf (largely made up of true shortleaf and loblolly) includes the lighter wood, generally of more rapid growth. The lumber commonly known as "Arkansas shortleaf" is lighter in color and weight than the average shortleaf. Virginia pine lumber is generally made up of rapidly grown, wide-ringed material suitable for the less permanent forms of construction.

The names of the principal southern pines are as follows:

Common name	*Botanical name*	*Other names*
Longleaf pine	*Pinus palustris*	Longleaf yellow pine. Southern yellow pine. Pitch-pine (export trade). Longstraw pine. Georgia pine. Florida pine. Texas yellow pine. Hard pine. Heart pine.
Slash pine	*Pinus caribaea*	Cuban pine. Yellow slash pine. Swamp pine. Pitch pine.
Shortleaf pine	*Pinus echinata*	Shortleaf yellow pine. Yellow pine. Arkansas shortleaf pine. North Carolina pine. Spruce pine. Rosemary pine.
Loblolly pine	*Pinus taeda*	Oldfield pine. North Carolina pine. Sap pine. Shortleaf pine.

Distribution and growth.—Longleaf pine grows in the southeastern part of the United States in a belt about 150 miles wide extending along the Atlantic coast from Virginia to Florida and westward into Texas (fig. 1). The largest remaining stands are in the States bordering on the Gulf of Mexico. Longleaf pine grows in pure stands on practically all soils except the rich alluvial or very wet soils. During the first few years the growth of young seedlings consists chiefly in the development of a large root system. From an age of about 5 to 25 years growth is rapid. Under average conditions longleaf pine reaches a height of 36 feet and a diameter of 5 inches in 20 years and a height of 82 feet and a diameter of 11 inches in 70 years.

Slash pine has a somewhat more restricted range than longleaf, shortleaf, or loblolly pine—extending from the southern part of South Carolina westward through southern Georgia, Alabama, Mississippi, and southeastern Louisiana and southward throughout Florida (fig. 2.) Slash pine is now spreading over much of the land formerly dominated by longleaf pine. It thrives on poorly drained flats near bays and swamps, but is not found on the dry, sandy ridges that occur in its range. Slash pine grows rapidly, especially when young. Trees 10

years old, grown under normal conditions, average 25 feet in height and 2.5 inches in diameter. At 20 years the average height is 45 feet and average diameter 7.5 inches, and at 60 years 85 feet and 11 inches, respectively.

Shortleaf pine grows throughout most of southeastern United States (fig. 3). It is mostly a tree of the uplands and foothills but extends into the lower levels. In the southern portion of its range shortleaf pine rarely grows above an altitude of 2,500 feet and in the northern portion not above 1,000 feet. East of the Mississippi River over an extensive area shortleaf pine grows in pure stands or scattered among hardwoods. West of the Mississippi it frequently forms pure stands on the tablelands of the hill country, especially in Arkansas, northern Louisiana, and Missouri. Under average conditions, shortleaf reaches a height of 34 feet and a diameter of 4.5 inches in 20 years and a height of 82 feet and a diameter of 12.0 inches in 70 years. Unlike all other commercial pines, shortleaf sprouts vigorously when cut or burned back during early life which is a characteristic of marked help in reproducing cut-over stands.

Loblolly grows along the Atlantic coast and Gulf of Mexico in a belt about 200 miles wide extending from Delaware to Texas (fig. 4). Many areas from which the original longleaf pine forests were cut have grown up in loblolly pine. The contributing factors are the abundant crop of small seeds which is widely distributed by the wind, the rapid growth and general hardiness of loblolly pine seedlings, and their comparative freedom from injury by "razorback" hogs. These animals are common denizens of southeastern forests and are especially destructive to longleaf pine seedlings. Loblolly pine grows faster than either longleaf or shortleaf but not as fast as slash pine during the first 15 years of growth. After that, loblolly and slash pine apparently maintain about the same rate for the next 30 or 40 years. When grown under average conditions, loblolly pine reaches a height of 43 feet and a diameter of 7.6 inches in 20 years; a height of 85 feet and a diameter of 12.4 inches in 60 years; and a height of 89 feet and a diameter of 13.4 inches in 70 years.

Supply.—The original pine forests of the South Atlantic and Gulf States covered about 130 million acres and had a stand of pine timber close to 650 billion board feet. Of this, about two-thirds was longleaf pine (including longleaf and slash) and one-third shortleaf pine (including shortleaf, loblolly, Virginia pine, etc.). An estimate, based largely on a forest survey begun in 1932, places the total stand of southern pine of saw-timber size at 196,840,000,000 board feet distributed as indicated in table 1.

TABLE 1.—*Estimated stand of southern pine saw timber in eastern United States by regions and States* [1]

Region	Stand
	Thousands of board feet
Northeast: Middle Atlantic States	[2] 597, 000
Central States	[2] 184, 000
South:	
Middle South:	
Kentucky	[3] 48, 837, 000
North Carolina	
South Carolina (¾ area of State)	
Tennessee	
Virginia	
West Virginia	
Deep South:	
Alabama	25, 304, 500
Arkansas (¾ area of State)	17, 655, 700
Georgia	32, 270, 400
Florida	13, 986, 500
Mississippi	16, 124, 200
South Carolina (¼ area of State)	5, 763, 300
Louisiana	15, 473, 500
Texas (extreme east)	18, 129, 600
Oklahoma (⅒ area of State)	2, 514, 300
Total Deep South	[4] 147, 222, 000
Total southern pine	[2] 196, 840, 000

[1] It should be understood that some of the estimates are rough approximations subject to change as more definite information becomes available.

[2] Based on data prepared by the U. S. FOREST SERVICE on FOREST LANDS OF THE UNITED STATES for the Joint Committee on Forestry, 77th Cong., 1st sess., Senate Doc. 32, 42 pp. 1941.

[3] This figure obtained by subtracting the sum of the stands in the Deep South, the Northeast, and the Central States from the total stand as given in Senate Doc. 32. (See footnote 2.)

[4] Based on a survey conducted by the Southern Forest Experiment Station of the Forest Sevice, U. S. Department of Agriculture, as part of a Forest Survey of the United States.

FIGURE 2.—Range of slash pine (*Pinus caribeae*).

The southern pine in the forests of the Deep South makes up about three-fourths of the total stand of southern pine. The species included and the stand of each is as follows (see footnote 4 to table 1).

	Billion board feet
Longleaf pine	19
Slash pine	14
Shortleaf pine	42
Loblolly pine	67
Other southern yellow pines	5

The largest amounts of longleaf pine saw timber are located in Florida, Alabama, and Georgia, which contain some 13 billion board feet. Slash pine grows principally in Florida and Georgia, which contain about 11 billion feet. Shortleaf, the most widely distributed of the southern pines, has its largest stand in Arkansas (approximately 10 billion board feet). Other States with large stands of shortleaf are Texas (7.5 billion), Georgia (6.6 billion), Alabama (6 billion), and Mississippi (5.2 billion). Loblolly, the most abundant of the southern pines, grows principally in Georgia (15 billion board feet), Alabama (12.4 billion), and Texas (9.4 billion).

In addition to saw timber, the forests of the Deep South include approximately 152 million cords of southern pine under saw-timber size. In the nine States in which the survey was conducted, over one-half of the area was forested—largely with second-growth timber. Only a very small proportion of the virgin forest remains uncut.

Production of Lumber.—In 1869 [3] the production of southern pine lumber amounted to 1,367,000,000 board feet (fig. 5). In 1909 it reached its maximum of 16,277,000,000 board feet. Since then production has fallen irregularly and in 1932, a year of business depression, it dropped to 3,069,000,000 board feet. For the 10-year period 1933–42 the average annual cut of southern pine lumber was 7,686,000,000 board feet. The cut in 1942 was 11,761,000,000 board feet.

Georgia led in the production of southern pine lumber in 1869, 1879, and 1899. In 1904 Louisiana took the lead and held it until 1925 when it was displaced by Mississippi. For the period 1925–36 Mississippi and Alabama occupied first or second place. Since 1936 Alabama has held first place, except in 1938 when North Carolina was first and Alabama second. In 1942 the four leading States in southern pine lumber production were Alabama, Georgia, Mississippi, and North Carolina. These produced over 50 percent of the total cut of southern pine lumber, which came from 24 States.

Pulpwood.—The cut of southern pine pulpwood amounted to approximately 142,000 cords in 1917. This was about 2.5 percent of the total pulpwood consumption for the United States. By 1940 the consumption of southern pine pulpwood had risen to 5,013,000 cords and made up over one-third of the total pulpwood consumption, and by 1942 it had further risen to 6,700,000 cords, approximately one-half of the total for the United States and equivalent to 2,010,000,000 board feet.[4]

Railway ties.—In 1914 about 10,600,000 southern pine ties were treated with preservatives. Since 1914 the number treated has varied from a maximum of 21,512,000 in 1921 to a minimum of 4,484,000 in 1933. The average number of southern pine ties treated annually for the 10-year period 1931–40 was approximately 8,528,000. If it is assumed that 90 percent of all southern pine ties are treated, the total number of southern pine ties used annually would be 9,475,000. If it is also assumed that 50 percent are hewed and 50 percent sawed, the annual consumption of hewed ties in recent yeasr would be 4,737,000,[5] equivalent to approximately 142,111,000 board feet.[6]

Poles.—Practically all southern pine poles are treated with a preservative before they are placed in service. The number of such poles treated in the 10-year period 1931–40 varied from a minimum of 616,000 in 1932 [7] to a maximum of 3,562,000 in 1939 with an average of 1,937,000 poles per year, equivalent to approximately 135,590,000 board feet.[8]

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[3] Earliest year for which figures on the production of southern pine lumber are available.
[4] A cord of pulpwood is considered to contain 300 board feet.
[5] Sawed ties are included in the lumber production statistics.
[6] A standard railway tie contains approximately 30 board feet.
[7] A year of business depression.
[8] A pole of average size is considered to contain 70 board feet.

Slack cooperage.—Southern pine is the leading wood in the production of both slack staves and slack heading. If it is assumed that 80 percent of the "pine" reported by the Bureau of the Census in the statistics for slack cooperage was southern pine, the average annual consumption of southern pine for the last few years for staves and heading for slack barrels amounted to approximately 115,500,000 board feet. Staves and heading each made up about one-half of this total.

Veneer.—The consumption of southern pine logs for veneer since 1918 has varied from a minimum of about 46,000,000 feet log scale in 1925 to a maximum of about 120 million feet log scale in 1929.[9] The average annual consumption for the period 1929–39 was 79,661,000 feet log scale, equivalent to about 95,000,000 board feet.[10] Consumption of southern pine for veneer in 1939 [11] was equivalent to approximately 62 million board feet.

Piling.—The amount of southern pine piling treated annually has varied from a minimum of 5,450,000 linear feet in 1914 to a max-

[9] Figures for the consumption of southern pine logs for veneer since 1918 are available for the following years: 1919, 1925, 1927, 1929, 1935, 1937, and 1939.
[10] The overrun in log scale is considered to be 20 percent.
[11] The latest year for which veneer statistics (Bureau of the Census) are available.

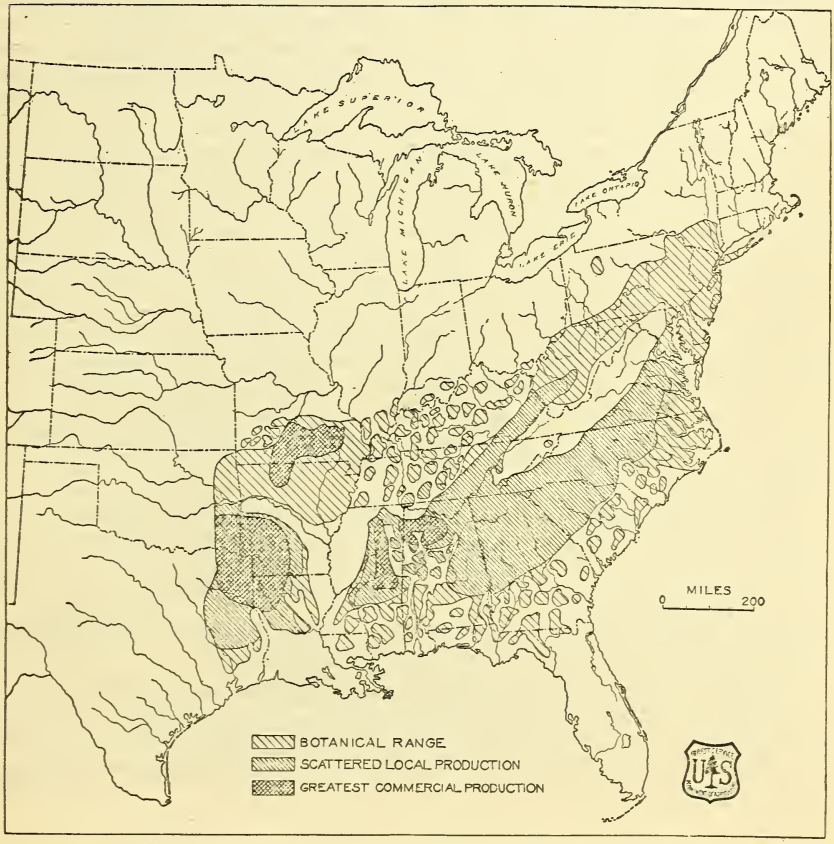

FIGURE 3.—Range of shortleaf pine (*Pinus echinata*).

imum of four times that amount in 1930. For the 10-year period 1931–40 the average annual amount was 12,808,000 linear feet. In 1940 nearly 20 million linear feet of piling was treated. Assuming that 60 percent of all southern pine piling is treated, the total amount of such piling produced annually would be 21,347,000 linear feet, equivalent to approximately 42,694,000 board feet.[12]

Destructive distillation.—In 1905 approximately 50,000 cords of southern pine were used for destructive distillation purposes in the production of wood turpentine, tar, pine oil, and charcoal. By 1929 [13] this amount had increased nearly 10 times to about 496,000 cords, containing approximately 37 million board feet of lumber.[14]

Excelsior.—The average annual consumption of southern pine for excelsior in recent years [15] has amounted to about 47,000 cords, equivalent to 14,100,000 board feet.[16]

All these uses require approximately 9,300,000,000 board feet of southern pine annually. To this figure must be added a large but indeterminate amount for fuel wood [17] and smaller amounts for fence posts, mine timbers, etc. The total amount of southern pine of saw-timber size used annually for all purposes is estimated at approximately 12 billion board feet.

Properties.—The wood of the various southern pines is quite similar in appearance. The distinction between the yellowish white sapwood and the reddish brown heartwood is generally evident, and the annual rings, each made up of a band of dark summerwood and a band of light-colored springwood, show distinctly. The width of the annual rings generally varies with the age of the tree, being greatest in early life and least in the sapwood of mature trees, although this is dependent on conditions of growth. If the stand is thinned, the remaining trees often have a considerably accelerated rate of growth. The transformation from sapwood to heartwood begins when the tree is about 25 years old. The sapwood in a log of southern pine contains less resin than the heartwood.[18] The resin in the sapwood is limpid and exudes from a fresh cut. Exudation of resin seldom occurs in the heartwood. The wood of any species of southern pine may vary widely with conditions of growth, and it is not unusual to find light-weight, wide-ringed wood and comparatively heavy and close-ringed wood in the same tree. It is comparatively easy to distinguish the various southern pines in the forest by their foliage but practically impossible to distinguish between them by examining pieces of wood.

Typical slash pine is classed as very heavy and very strong. It is the heaviest [19] and strongest of the southern pines with typical

[12] The average length of piling is taken as 50 feet, and a piece of 50-foot piling is assumed to contain 100 board feet.

[13] Latest year for which statistics are available.

[14] It is assumed that 75 percent of the southern pine used for distillation is stumpwood from which lumber cannot be cut and that the remaining 25 percent is capable of yielding 300 board feet of lumber per cord.

[15] Recent years for which statistics are available include 1923, 1925, and 1935.

[16] A cord of excelsior wood is considered equivalent to 300 board feet.

[17] Southern pine fuel wood is estimated to include 2 billion board feet of material of saw-timber size and a larger volume of material too small for saw timber.

[18] In longleaf pine the sapwood often contains about 2 percent of resin and the average heartwood 7 to 10 percent. Heartwood in butt logs may contain 15 percent of resin and in the stump 25 percent. These percentages are based on the air-dry weight of the wood (12 percent moisture).

[19] The average weight per cubic foot of the 4 principal southern pines in a thoroughly air-dry condition (12 percent moisture) is as follows: slash pine—43 pounds; longleaf pine—41 pounds; shortleaf pine—36 pounds; loblolly pine—36 pounds.

longleaf running a close second. In other properties both of these woods are classed as very stiff, hard, and moderately high in shock resistance. Typical shortleaf and loblolly pines are somewhat lighter in weight than longleaf and somewhat below it in strength properties. It is quite possible, however, to find material cut from shortleaf and loblolly that is stronger and harder than typical longleaf or slash. Pitch pine, which may be taken as representative of the material known as "Virginia pine "on the market, is moderately light in weight, weak, moderately low in stiffness, moderately soft, and moderately low in shock-resisting ability.

In order to provide a visual method of securing heavy, strong wood for structural purposes, specifications often call for "dense" material under the provisions of the "density rule".[20] Dense southern pine structural timbers must show on one end an average of at least 6 annual rings per inch and an average of at least one-third summerwood in the annual rings.[21] No distinction is made as to species. Longleaf and slash make up the greater part of the material which meets these requirements. In nail-holding ability [22] the southern pines as a whole rank above hemlock, spruce, and Douglas-fir, but below the heavier hardwoods such as oak, maple, and birch. The heartwood of dense, resinous [23] longleaf and slash ranks high in resistance to decay, which is about equal to white oak and next to the cedars, cypress, and redwood. The heartwood of shortleaf and loblolly and the less dense and resinous longleaf and slash is intermediate in durability but ranks above hemlock and spruce in this respect. Sapwood, which makes up a large proportion of some of the southern pines, is lacking in durability but can be readily treated with preservatives and its durability markedly increased.

Southern pine lumber can be satisfactorily seasoned either by air-drying or kiln-drying, provided methods adapted to the various classes of material are used. All of the southern pines have a moderately large shrinkage. When properly seasoned, they stay in place well but are not the equal of the white pines in this respect. The green heartwood of both longleaf and shortleaf contains moisture ranging from 25 to 50 percent of the weight [24] of the wood. Green sapwood contains from 70 to 130 percent of moisture in longleaf and up to 180 percent in shortleaf.

Dense heavy stock requires more time to season than lighter stock, and the drying period is obviously lengthened when stock contains a large amount of moisture. Pitch acts as a retardant to the movement of moisture and also adds to the time required for drying. The southern pines are classed with Douglas-fir and red pine in the group of woods that hold paint least satisfactorily. The wood of the southern pines is suitable for the manufacture of many kinds of paper.

[20] Adopted by the American Society for Testing Materials and embodied in grading rules of lumber associations.

[21] The various grades also have provisions limiting the number, size, and quality of knots and other defects.

[22] The nail-holding ability of various woods, like many other properties, is in general closely related to dry weight. The heaviest woods have the greatest nail-holding ability.

[23] Resin is not poisonous to decay-producing organisms like a wood preservative, but it fills the pores of the wood and greatly retards the formation of conditions favorable to decay.

[24] The dry weight of the wood is used in moisture calculations, i. e., if a piece of wood contains 50 percent moisture, it means that one-half of the dry weight of the wood is water.

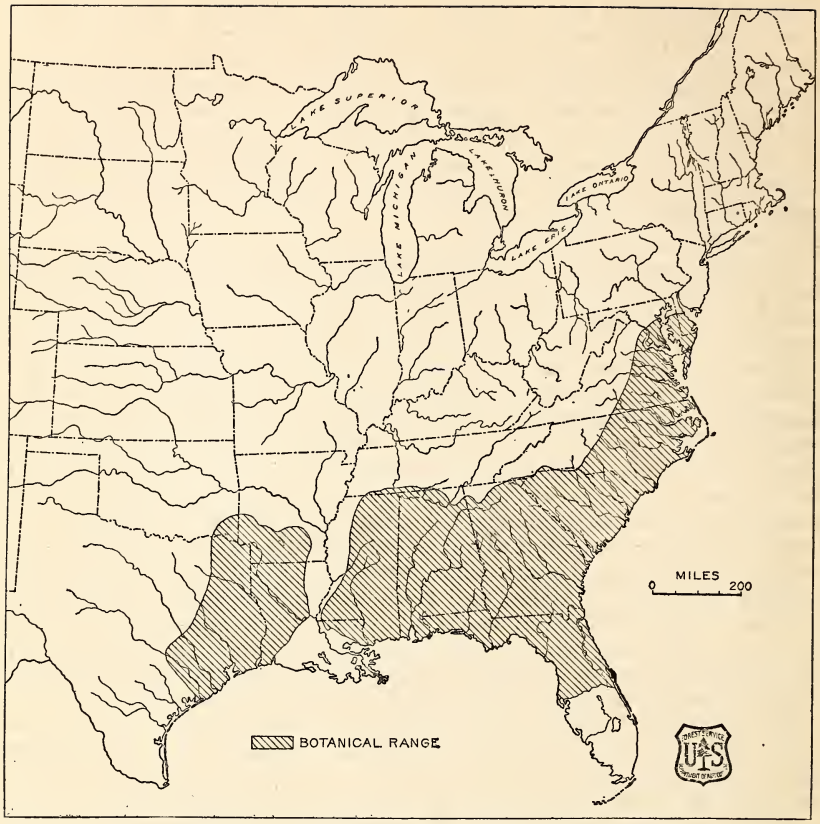

FIGURE 4.—Range of loblolly pine (*Pinus taeda*).

The resin in the southern pines is stored in elongated passages or resin ducts in the growing tissue just beneath the bark. When a cut is made in this growing tissue, the formation of resin ducts is stimulated and the amount produced is considerably increased. If a new cut is made just above the old one after the additional ducts have had time to form (2 to 4 weeks), the flow of resin will be considerably increased over that obtained from the original wound. This property is made use of in tapping longleaf and slash pines in turpentine operations.

Principal uses.—Longleaf and slash pine are extensively used in factory, warehouse, bridge, trestle, and dock construction in the form of stringers, beams, posts, joists, and piling. They are also widely used for flooring and in lesser amounts for car construction and repair, and in ship and boat building. Shortleaf and loblolly pine lumber is used principally for building material such as interior finish, ceiling, frames and sash, wainscoting, weatherboarding, sheathing, subflooring and joists, and for boxes and crates (made from lumber and veneer),

agricultural implements, motor vehicles, low-grade furniture, caskets and burial boxes, woodenware and novelties, etc. Shortleaf and loblolly pines are also used for slack cooperage. Typical shortleaf is comparatively soft and light in weight, has little resin, is easy to work, and is widely used for general house carpentry. Shortleaf and loblolly are also used for heavier construction purposes especially when treated with a preservative to increase their resistance to decay or insect attack.

Considerable use is made of the southern pines for railway ties, telephone and telegraph poles, and mine timbers. Ties and poles are generally given a preservative treatment.

The resinous product obtained by "turpentining" longleaf and slash pine is the crude gum from which turpentine and rosin, known together as naval stores, are made. The bulk of the naval stores used in the world comes from the longleaf and slash pine forests of the United States. In the turpentining process, cuts are made in the sapwood of standing trees with a special tool called a hack. These cuts or "streaks" are renewed at weekly intervals for about 34 weeks each year. The resin (crude gum) flows from the wounds into cups hung on the trees and is collected and distilled to yield turpentine and a residue of rosin.

The wood of the southern pines, especially heartwood rich in resin, is used for distillation purposes. The wood is chipped and then heated in closed retorts and the resulting vapors recovered by condensation. Wood turpentine, tar, and tar oils are obtained by this process with a residue of charcoal. Wood turpentine and pine oil are also obtained from the wood of the southern pines by steam distillation and by a process in which the resinous matter in the chips is dissolved by a petroleum solvent and then recovered.

Considerable quantities of southern pines are used in making wrapping paper and pulp board almost entirely by the sulfate process. The resin does not interfere with its effectiveness as is the case with the other standard pulping processes.[25] If these other processes are

[25] The four standard pulping processes are the sulfate, sulfite, soda, and mechanical.

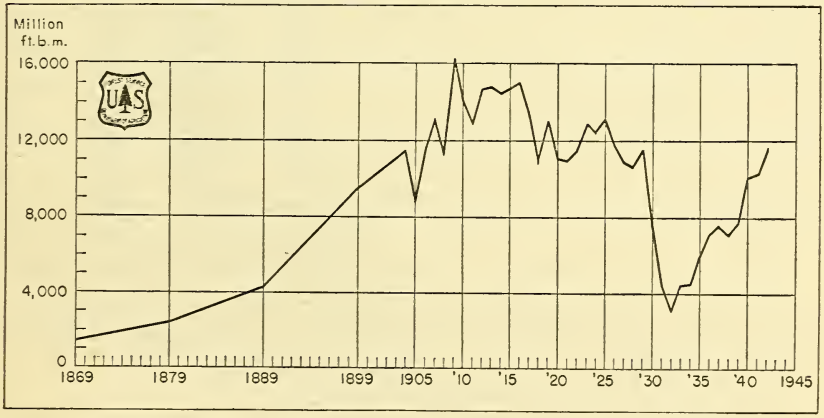

FIGURE 5.—Lumber production of southern pine, 1869–1942.

employed, the raw material must be limited to sapwood with its low resin content. This requirement means that only young trees (25 to 30 years old), which are practically all sapwood, can be used. The extensive cutting of young southern pines for pulp, unless properly regulated, might seriously affect future supplies for purposes which require comparatively large trees. Recently developed modifications of the sulfate and other processes [26] have made possible a much extended use of the southern pines for a wider range of pulp and paper products, including newsprint.

Table 2 gives the amount of southern pine used in the manufacture of different classes of products in 1912, 1928, 1933, and 1940. This material is largely in the form of lumber with much smaller amounts of veneer, logs, and bolts.

[26] These modified processes were developed by the Forest Products Laboratory of the U. S. Forest Service. They have made possible the manufacture of strong, white print paper from southern pines utilizing heartwood or sapwood, or both. They are increasing in commercial use.

TABLE 2.—*Southern pine used in the manufacture of wooden products*
[Thousands of board feet]

Classes of products	1912	1928	1933	1940
Airplanes		5		8
Agricultural implements	98,453	66,739	10,092	11,057
Boot and shoe findings				
Boxes, baskets and crating	1,044,993	1,230,353	[1] 656,499	[1] 1,029,886
Boxes, cigar and tobacco			11,198	
Car construction and repair	678,114	417,577	181,195	272,644
Caskets and burial boxes	11,971	13,468	6,693	9,935
Conduits, pumps and wood pipe	[2] 65,465	2,004	20	85
Dairy, poultry and apiary supplies	([3])	4,089	2	299
Dowels and skewers				
Electrical equipment	1,265	502	168	508
Fixtures	11,612	9,223	1,306	1,780
Flooring	([4])	([4])	66,633	232,573
Furniture	18,946	11,861	6,636	19,881
Handles	67	6,055	4,651	6,015
Instruments, musical	2,108	179	16	15
Instruments, professional and scientific	47	110	2	3
Ladders	([3])	([3])	2,473	5,428
Laundry appliances	1,397	253	744	649
Machinery	28,778	34,288	63	773
Patterns and flasks	1,951	365	836	6,625
Pencils, penholders	([5])	([5])		
Playground equipment	1,448	694	742	226
Plumbers' woodwork	262			
Printing material	337	10		
Radio and phonograph cabinets	([6])	([6])	25	
Refrigerators	[7] 7,873	[7] 10,627	1,487	1,106
Rollers, shade and map	1,150	1,412	14	682
Sash, doors, general millwork	[8] 6,460,044	[8] 2,741,687	[9] 62,995	[4] 205,721
Sewing machines	65	135		
Ship and boat building	65,699	48,784	6,542	19,487
Shuttles, spools, bobbins and looms				82
Signs, scenery, displays	429	28,168	1,529	3,919
Sporting and athletic goods	943	1,988	87	5,278
Tanks	41,292	6,524	1,257	2,992
Toys		2,101	598	6,097
Trunks and valises	15,278	3,754	606	123
Vehicles, motor	([10])	61,298	7,972	13,169
Vehicles, nonmotor	31,205	4,454	1,081	1,082
Venetian blinds	([4])	([4])	([4])	94
Woodenware and novelties	[11] 19,493	[12] 4,106	3,464	1,304
Total	8,610,685	4,712,833	1,037,626	1,859,526

[1] Figures for 1933 and 1940 include southern pine used for boxes and crates by plants not classified as manufacturers of wooden products, and not included in 1912 and 1928. The amounts included for non-manufactures of wooden products were as follows: 1933—189,193,000 board feet, and 1940—432,302,000 board feet.
[2] Includes paving material.
[3] Included in "Woodenware and novelties."
[4] Included in "Sash, doors, general millwork."
[5] Included in "Instruments, professional and scientific."
[6] Included in "Furniture."
[7] Includes "Kitchen cabinets."
[8] Includes planing mill products such as flooring, siding, ceiling, etc.
[9] Planing mill products were not included in 1933 and 1940 canvasses as in 1912 and 1928, except flooring, which is listed separately.
[10] Included in "Vehicles, nonmotor."
[11] Includes "Dairy, poultry and apiary supplies" and "Ladders."
[12] Includes "Ladders."

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